

fingers or a pair of pliers before continuing. Once you have replaced the original 74LS04 with the chip/clip, drape its wire over the side of your computer so that it's at hand when you need it.

Installing the Card(s):

Unlike printer-, 80-column- and disk drive controller-cards, you are not required to put either Snapshot or the RAMrod 128K in any particular slot. Whatever Snapshot software you are running will ask you where each card is located if it needs to know. Nevertheless, there are certain slots which you should steer clear of. Here they are:

Apple II+ (and lookalikes) - Slot 0 is suitable only for memory cards. (If you are using the RAMrod 128K card for Shuttle work-spaces, you will need a 16K Language/RAMcard in this slot.)

Apple //e - Auxiliary slot 3 is designed to take //e-type 80-column cards only.

The Snapshot and RAMrod cards can be inserted into any vacant slot(s) apart from those referred to above. In each case, place the keyboard end of the gold (yes it really is gold) edge-connector into the appropriate end of the slot you have chosen and press the card gently home. Do not wiggle it from side to side, keep it straight. When you are satisfied that the card is seated properly, installation of the RAMrod 128K is complete.

Snapshot owners should push the trigger cable through the most convenient of the holes at the back of their computer and place the push-button close at hand.

Look at the bank of small switches at the top/center of the Snapshot card. They should all be in the ON position (UP) if there is no chip/clip installed. If you own one of those computers which do require the chip/clip, the rightmost of the switches (that which is located closest to the back of your computer) should be set to the OFF position (DOWN). Near the top right-hand corner of the Snapshot card, you will find a small pin projecting under the identifier "R10". Attach the spring-clip (or socket) at the loose end of the chip/clip to this pin. When you have done this, installation is complete.

(The 74LS04 controls the signal to the microprocessor known as the DMA. Generally speaking, you may remove the Snapshot card and leave the chip/clip installed at the motherboard end - keeping the free end away from any other components - with no effect on the normal operation of your computer. The DMA signal is also used by some other cards, however, notably the Z80 co-processor. If you have a Z80 card installed and you wish to run CP/M while the Snapshot card is de-installed, you will have to replace the original 74LS04 chip or re-install the Snapshot Card. When the Snapshot card is in place, your Z80 will function normally.)

Snapshot Version //e Card and RAMrod 128K Card Installation Procedures



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Snapshot is a peripheral card with its own 8K of on-board Random Access Memory. Various software packages have been designed to use this RAM in order to run independently without disturbing the program in your computer's main memory.

The RAMrod 128K card is a standard memory expansion board which is functionally identical to the Saturn 128 and the Ramex 128, and is thus compatible with all software written for them. Dark Star offers the card for use with the Snapshot Shuttle multi-tasking program. If you require utilities such as Visicalc expansion and/or RAMdisk software for use in conjunction with the card, these may be obtained from your dealer or directly from Dark Star Systems.

As long as you follow these instructions carefully, you will find that installation of the Snapshot card is a simple and painless procedure.

Safety Precautions:

When you come to install anything in your computer, you must turn the power off. This is not just for your own good; pulling things out of (or pushing things into) your computer while the power is on is very likely to burn something out somewhere, and finding out what and where will certainly burn a hole in your pocket.

When you have switched off your computer and removed its lid, you should find the power supply. This is encased in "gold" metal, usually to the left of the motherboard. Before touching anything else, just press the tips of your fingers lightly onto the power supply casing for a few seconds. This will discharge any "chip-killing" static electricity which you have built up in your body. You're now ready to install the Snapshot hardware.

The Snapshot Chip/clip:

If you just have the RAMrod 128K card, you can now skip to the "Installing the Card(s)" section.

When you opened the Snapshot packaging, you should have found 2 items of "hardware": a peripheral card much like any of the others in your computer, and a length of wire with an integrated circuit attached to one end and a clip or socket at the other end. We'll refer to the latter item as the "chip/clip".

The first thing to do before continuing further is to establish whether or not the chip/clip is required by your particular computer. The general rule is that if you own an Apple //e, you don't need to install the chip/clip; if you own any other type of Apple II-compatible computer, you do need to install it. Here's the inevitable exception to the rule: If you own a 48K II or II+ without a Language/RAM card in slot 0, you don't need the chip/clip.

So what is this chip/clip contraption that you may or may not need to install? What it does is simply to provide a direct link between the Snapshot card and the "upper 16K" of a 64K program. Snapshot doesn't need the chip/clip with the Apple //e because it already has a link with that upper 16K via the motherboard and, of course, a computer without a RAM card in slot 0 cannot run a 64K program anyway. (Even if the chip/clip proves to be unnecessary, you shouldn't discard it; it would be better to keep it somewhere safe. You never know, you may want to use Snapshot with another computer one day.)

Installing the Chip/clip:

If you have ascertained that you do not need the chip/clip, you can skip to the "Installing the Card(s)" section without missing anything important.

Let's examine the motherboard of your computer. If you own an Apple II+, you'll find that near the keyboard end, there is a printed white square containing 24 memory chips. (Each chip is identified with the word "RAM" printed beside it on the motherboard.) Just outside the lower right-hand corner of this square, in the bottom row, you will find a chip with the identifier "74LS04" printed on it. Other letters may appear before or after this identifier.

If you have an Apple-compatible computer, the chances are that the motherboard is arranged somewhat differently to that of the Apple II+. However, the chip we are looking for will still be there somewhere. Don't worry - as long as you can find one with "74LS04" (or sometimes "7404") on it, you've got the right chip. The motherboard will probably have the same identifier printed below the socket, so you can double-check that it is the correct one. Once found, this chip must be removed.

Removal is easy. Use a chip extractor or a small screw-driver to prise it gently from its socket. Be sure that whatever instrument you are using is inserted between the chip and its socket (not between the socket and the card). Try not to bend the chip's pins. Once you have accomplished its removal, put your 74LS04 away in a safe place in case you want to de-install the Snapshot card in the future.

The integrated circuit on the chip/clip replaces the one you have just removed and you should now put it in the empty socket, making sure that its identifier faces the same way as those of the other chips in that row. (The wire leading from the chip should extend towards the white square containing RAM on the Apple II+ motherboard.) Insert the chip/clip by pressing straight down. Do not force it. If the pins are splayed a bit wider apart than the holes, try getting one row of pins into position above the holes, then "roll" the other row into place while pressing downwards and inwards on the opposite edge. In any case, be gentle! The pins are easily broken, and impossible to replace. If a pin becomes bent, restore it gently with your